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EXAMINER	
WALTER, CRAIG E	
ART UNIT	PAPER NUMBER
2188	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/705,470	FAIR ET AL.	
	Examiner	Art Unit	
	Craig E. Walter	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/14/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 14 June 2007 has been entered.

Status of Claims

2. Claims 1-37 are pending in the Application.

Claims 1, 2, 4, 5, 11, 15, 16, 18-20, 22, 28 are amended.

Claims 32-37 are new

Claims 1-37 are rejected.

Response to Amendment

3. Applicant's amendments and arguments filed on 14 June 2007 in response to the office action mailed on 14 February 2007 have been considered but are moot in view of the new ground(s) of rejection.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 14 June 2007 was fully considered by the examiner.

Claim Objections

5. Claims 22-31 are objected to because of the following informalities:

As for claim 22, the phrase "in response to storage operating system" as recited in line 9 of the claim should be changed to "in response to said storage operating system" to properly establish antecedent basis for the storage operating system.

Claims 23-31 are objected to for further inheriting the deficiency of claim 22.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 11 and 15-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Hitz et al. (US Patent 5,819,292), hereinafter Hitz.

As for claim 11, Hitz teaches a method for detecting leaked buffer writes between a first consistency point and a second consistency point, comprising:

selecting a data buffer (a buffer is selected to store the inode which contains the meta-data file – col. 9, lines 19-49. The meta-data file comprises, *inter alia*, a block map – col. 5, lines 48-59. Hitz further describes the block map as consisting of information for up to 20 snapshots. Since the consistency points are classified as points after a snapshot, the block map comprises the information needed to ascertain the consistency point number – col. 4, lines 6-43);

determining if the selected data buffer includes a buffer check control structure (the system inherently makes a determination if the buffer check control structure within an inode is present simply by referring to the data recorded within it);

determining, in response to the selected data buffer including a buffer check control structure, if a consistency point number within the buffer check control structure is correct, and if so, performing a write operation of the file system buffer (before converting to a new consistency point, the system will perform a check sum on the fsinfo structure (containing the root inode which comprises the consistency point information) to determine if the one of the copies has been corrupted in some way. Once consistency is determined, the system will continue to write the new node to the disk – col.12, lines 11-48).

As for claim 15, Hitz teaches the method of claim 11 wherein the step of determining if the consistency point number is correct further comprises the step of determining if the consistency point number within the buffer check control structure

equals a consistency point number identifying a current consistency point (col. 11, line 62 through col. 12, line 38 – the system maintains two identical copies of the root inode containing the information of the consistency point of the system. The system can then compare the current root inode with the copy to determine if the consistency point is accurate, and that no failure has occurred).

As for claim 16, Hitz teaches the method of claim 11 wherein the step of performing a write operation further comprises a step of writing a set of raw data within the data buffer to disk (all data written is written to the disk – see abstract. The data is buffered before flushed and written to the disk).

As for claim 17, Hitz teaches the method of claim 16 wherein the raw data comprises the buffer check control structure (both the buffer data structure (1010B), and the pointers (1010C) are stored and associated with the inode, hence comprise the raw data buffer associated with the data buffer – col. 7, lines 5-41).

As for claim 18, Hitz teaches the method of claim 16 wherein the step of performing the write operation further comprises a step of removing the buffer check control structure from the data before writing the file system buffer to disk (the buffered data is flushed (i.e. removed) from the buffer before it is written to the newly allocated regions on the disk - col. 12, lines 9-24).

As for claim 19, Hitz teaches the method of claim 16 wherein the step of performing the write operation comprises the step of writing only the raw data within the file system buffer to disk (col. 12, lines 9-24 – the raw data is the only data flushed to the disk during the update).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-5, and 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hitz (US Patent 5,819,292) and in further view of Marion et al. (US PG Publication 2003/0163661 A1) hereinafter Marion.

As for claims 1, 20 and 22, Hitz teaches method for detecting leaked buffer writes between a first consistency point and a second consistency point, the method comprising:

receiving a write operation, wherein the write operation identifies a file for the write operation to be performed on (Hitz's invention is directed to managing changes to a file system. In his disclosure, Hitz describes a Write Anywhere File-System Layout (WAFL) directed to writing new data (i.e. files) to the file system (i.e. storage system of claim 22). The files can write new inode files to the file system – col. 4, lines 6-32);

creating a data buffer associated with the write operation (referring to Fig. 10, when a new incore inode is created (1010A), an area is allocated to the inode in order to store information, a WAFL buffer structure (1010B), a set of pointers

(1010C), and an on-disk inode (1010D). The pointers point to the newly created indirect WAFL buffers (1020) – col. 7, lines 5-41). Note the area needed to store these elements is created (i.e. allocated) as Hitz explicitly describes his invention as writing new data to unallocated blocks on a disk – see abstract; and

Though Hitz teaches writing a buffer check control structure to a raw data buffer associated with the data buffer (again both the buffer data structure (1010B), and the pointers (1010C) are stored and associated with the inode, hence comprise the raw data buffer associated with the data buffer – col. 7, lines 5-41), he fails to do so in response to determining the volume has buffer leakage detection activated as recited in these claims.

Marion however teaches a system and method for tracking memory leaks which checks a memory leak flag to track memory allocation and de-allocation activities (paragraphs 0010, and 0011, all lines). More specifically, (referring to Fig. 3, elements 310, 320 and 330 and paragraph 0046-0048, all lines), a determination is made to track memory leaks or not (leak detection activation). Based on this determination, the remaining memory allocation executes. Note by combining the teachings of Hitz and Marion, Hitz would be able to check for memory leaks prior to allocating new files, and subsequently prior to writing the buffer control check structure to the raw buffer (i.e. in response to the determination).

It would have been obvious to one of ordinary skill in the art at the time of the invention for Hitz to further include Marion's method of tracking memory leaks

into his own system for maintaining consistency states of a file system during file allocation. By doing so, Hitz could benefit by having an efficient means of memory leak detection, which in turn could help improve system performance as taught by Marion, paragraphs 0007-009, all lines.

As for claim 21, though Hitz in further view of Marion teach all the limitations of the claim (as per the rejection of claims 1, 11 and 20, *supra*), they fail to specifically teach said method as being implemented on a computer readable media with instructions executed by a processor as recited in this claim.

Examiner takes Official Notice (see MPEP § 2144.03) that implementing a method to be performed on a file system (as described by Hitz) via the use of a "computer readable media containing instructions for execution on a processor" in a computing environment was well known in the art at the time the invention was made.

One of ordinary skill in the art would have been motivated to implement the method as instructions on a computer readable media, as it is well known in the art that such implementation is inexpensive, and easy to maintain.

Since Applicant failed to traverse the examiner's assertion of Official Notice, the use of a "computer readable media containing instructions for execution on a processor" is taken to be admitted prior art pursuant to MPEP § 2144.03, subsection C.

As for claims 2 and 23, Hitz teaches creating the data buffer as further comprising the step of creating a buffer control structure and a raw data buffer (the structures previously described in the rejection of claim 1 illustrate the buffer control

structure and raw data buffer which are created when the incore inode is created (i.e. allocated)).

As for claims 3 and 24, Hitz teaches the buffer control structure as comprising a pointer to the raw data buffer (the buffer structure contains pointers to reference the 16 buffer pointers (1010C) - col. 7, lines 5-16).

As for claim 4, Hitz teaches the method of claim 1 wherein the step of writing the buffer check control structure to the raw data buffer further comprises the steps of:

creating the buffer check control structure (again, the buffer check control structure is created upon allocation of the inode); and

overwriting a portion of the raw data buffer with the buffer check control structure (a portion of the raw data buffer is comprised of the buffer structure (1010B)).

As for claims 5 and 26, Hitz teaches the step of writing the buffer check control structure to the raw data buffer as further comprising the steps of:

creating the buffer check control structure (again, the buffer check control structure is created upon allocation of the inode); and

associating the buffer check control structure to the raw data buffer in a contiguous block of memory (the buffer check is associated with the raw data buffer as it contains pointers that reference a block within the buffer itself – col. 7, lines 5-41. Note by definition a block of data is contiguous; therefore the information is inherently stored contiguously. Additionally, Fig. 10 depicts the information as being stored contiguously in blocks).

As for claim 25, Hitz teaches overwriting the buffer (col. 23, lines 45-67 – see also Figs. 23A and 23B).

8. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Hitz (US Patent 5,819,292) as applied to claim 11 above, and in further view of Ganesh et al. (US Patent 6,192,377 B1), hereinafter Ganesh.

As for claim 12, though Hitz teaches determining if the buffer contains a buffer check control structure he fails to teach storing a magic number in said structure. Ganesh however teaches determining if one or more magic values are within the data buffer, as his system functions as to check the updated version of the block by determining the index (i.e. magic) number of the block (col. 4, lines 33-41).

As for claims 13 and 14, though Ganesh does not explicitly teach the magic number as comprising either a 64-bit value, two 32-bit values, nor the consistency point number as comprising a 32-bit value, such limitations are merely a matter of design choice and would have been obvious in the system of Ganesh. These limitations fail to define a patentably distinct invention over Ganesh since both the invention as a whole and that of Ganesh's are directed to storing a magic number used to uniquely identify the data block; and storing a consistency number, used to track certain points in time the system maintained a consistent state.

It would have been obvious to one of ordinary skill in the art at the time of the invention for the Hitz to further include Ganesh's apparatus for determining whether a transaction can use a version of a data. By doing so, he would have a means of more quickly and reliably examining and determining which particular version of updated data

blocks to use in a requested transaction, which in turn would require fewer system resources, making his system overall more efficient, as presently taught by Ganesh in col. 4, lines 42-64.

9. Claims 6-10, and 27-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of Hitz (US Patent 5,819,292) and Marion (US PG Publication 2003/0163661 A1) as applied to claims 4 and 26 above, and in further view of Ganesh (US Patent 6,192,377 B1).

As for claim 6, though the combined teachings of Hitz and Marion disclose storing consistency point numbers in the buffer check control structure, they fail to further teach storing one or more magic numbers.

Ganesh however teaches an apparatus for determining whether a transaction can use a version of a data item, in which he describes entries in data blocks as containing an index number (i.e. magic number). Also note that Ganesh additionally teaches a consistency point number (i.e. snapshot number) – col. 4, lines 33-41.

As for claims 7, 8 and 10, though Ganesh does not explicitly teach the magic number as comprising either a 64-bit value, two 32-bit values, nor the consistency point number as comprising a 32-bit value, such limitations are merely a matter of design choice and would have been obvious in the system of Ganesh. These limitations fail to define a patentably distinct invention over Ganesh since both the invention as a whole and that of Ganesh's are directed to storing a magic number used to uniquely identify the data block; and storing a consistency number, used to track certain points in time the system maintained a consistent state.

It would have been obvious to one of ordinary skill in the art at the time of the invention for the combined teachings Hitz and Marion to further include Ganesh's apparatus for determining whether a transaction can use a version of a data. By doing so, they would have a means of more quickly and reliably examining and determining which particular version of updated data blocks to use in a requested transaction, which in turn would require fewer system resources, making his system overall more efficient, as presently taught by Ganesh in col. 4, lines 42-64.

As for claim 9, Hitz teaches his consistency point number as identifying a current consistency point (again, the most recently recorded consistency point is indicative of the system's most current point of consistency).

Claims 27-31 are rejected based on the same rationale as claims 6-10 respectively.

Claims 32, 33, 34, 35, 36 and 37 contain similar limitations as claims 6, 6, 9, 2, 4 and 5 respectively; therefore they are rejected based on the same rationale as these claims.

Response to Arguments

10. Applicant's arguments with respect to claims 1-37 have been fully considered, however they are moot in view of the new ground(s) of rejection.

11. It is worthy to note that claims 11 and 15-19 remain rejected under § 102 for the following reasons:

The claim was not amended to include the allegedly allowable features as discussed with the other independent claims (i.e. claim 1).

No specific arguments with respect to the patentability of claim 11 was set forth in Applicant's remarks, hence Applicant failed to sufficiently rebut Examiner's properly established *prima facie* case of anticipation.

As such, Applicant's argument with respect to claim 11 is not persuasive, and the rejection is maintained.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig E. Walter whose telephone number is (571) 272-8154. The examiner can normally be reached on 8:30a - 5:00p M-F.

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hyung S. Sough can be reached on (571) 272-6799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Craig E Walter
Examiner
Art Unit 2188

CEW

HYUNG SOUGH
SUPERVISORY PATENT EXAMINER
8/03/07